Public Hearing Agenda

- Open House
- DOE Presentation
- Public Comments (your input to DOE decision making)
- Adjourn

Global Nuclear Energy Partnership Programmatic Environmental Impact Statement

Public Hearings

Office of Nuclear Energy

November - December 2008

Presentation Outline

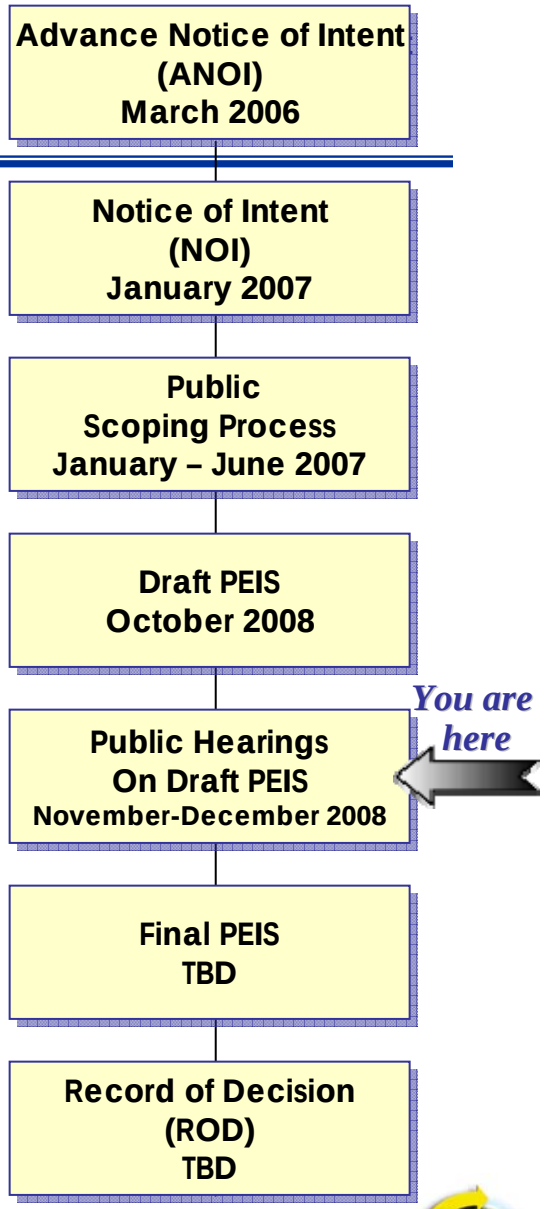
- **National Environmental Policy Act (NEPA) Process**
- **Global Nuclear Energy Partnership (GNEP) Programmatic Environmental Impact Statement (PEIS)**
  - DOE Changes to PEIS Scope as a Result of Scoping Process
  - Structure and Content of GNEP PEIS
  - Purpose and Need for Agency Action
  - Nuclear Power Basics
  - Domestic Programmatic Alternatives
  - Benefits of a Closed Fuel Cycle
  - Key International GNEP Initiatives
  - GNEP PEIS Environmental Analyses
  - Notable Results for Domestic Programmatic Alternatives

Presentation Outline (continued)

- Record of Decision and Implementation
- How Can You Help Us Make a Sound Decision
- How to Provide Your Comments

NEPA Process

- NEPA requires consideration of potential environmental impacts of proposed actions and alternatives
- This process utilizes involvement by the public and Tribes to produce more informed and better decision-making
- An Environmental Impact Statement (EIS) is required for any major Federal action that may significantly affect the quality of the environment
- A Programmatic Environmental Impact Statement (PEIS) is prepared for a broad program such as GNEP



DOE Changes to PEIS Scope as a Result of Scoping Process

- **Site selection for any future facility will not be made as a result of the GNEP PEIS**
- **The project-specific analysis was removed for siting and construction of new facilities**
  - An advanced recycle reactor
  - A nuclear fuel recycling center
  - An Advanced Fuel Cycle Facility (AFCF)
- **Added Four Programmatic Fuel Cycle Alternatives**
  - Thermal Reactor Recycle
  - Thermal/Fast Reactor Recycle
  - Once-Through using Thorium
  - Once-Through using Heavy Water Reactors (HWRs) or High Temperature Gas-Cooled Reactors (HTGRs)

Structure and Content of GNEP PEIS

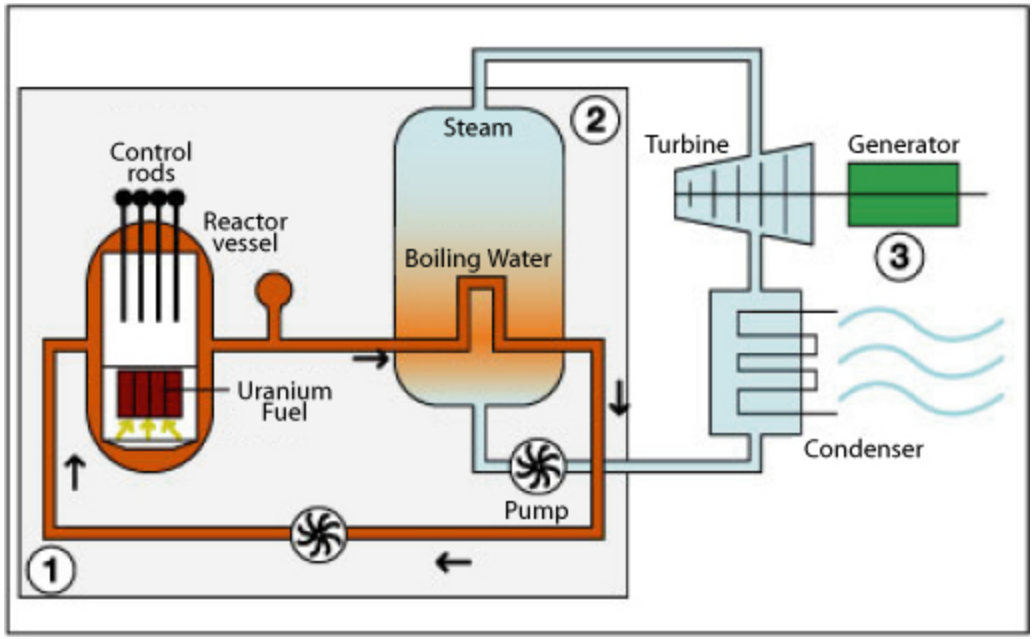
- Summary
- Introduction and Purpose and Need (Chapter 1)
- Programmatic Alternatives (Chapter 2)
- Affected Environment (Chapter 3)
- Environmental Impacts (Chapter 4 & 5)
- Regulatory Compliance (Chapter 6)
- International Initiatives (Chapter 7)
- Supporting Information and Technical Appendices (Chapters 8 – 11 and Appendices A – J)

Purpose and Need for Agency Action

- **Assess reasonable alternatives that:**
  - Support domestic and international expansion of nuclear energy production
  - Reduce nuclear proliferation risks
  - Reduce the volume, thermal output, and/or radiotoxicity of used or "spent" nuclear fuel or other radioactive wastes requiring disposal in a geologic repository

Nuclear Power Basics

- A typical commercial nuclear power plant generates electricity by fission (splitting) of uranium to produce heat and drive a turbine
- Nuclear power reactors do not emit air pollution or greenhouse gases and provide 70% of emission free electricity generation



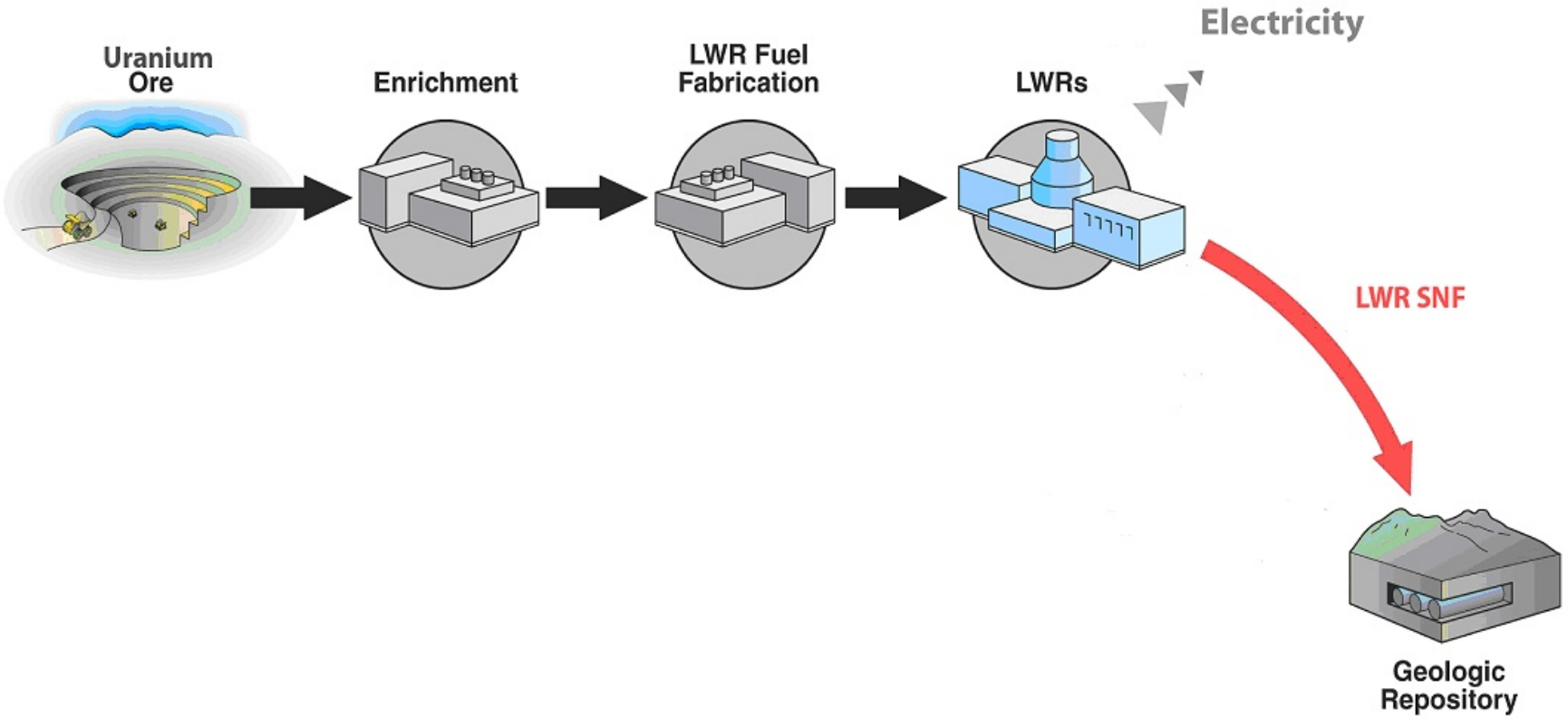
Nuclear Power Basics (Cont'd)

- **Nuclear power provides 20% of U.S. electricity**
- **After completing an operating cycle (typically 18-24 months), some uranium fuel is considered used up ("spent") and must be replaced with fresh fuel**
- **Two approaches to spent nuclear fuel management:**
  - open cycle or "once through" for ultimate disposal
  - closed cycle or recycle

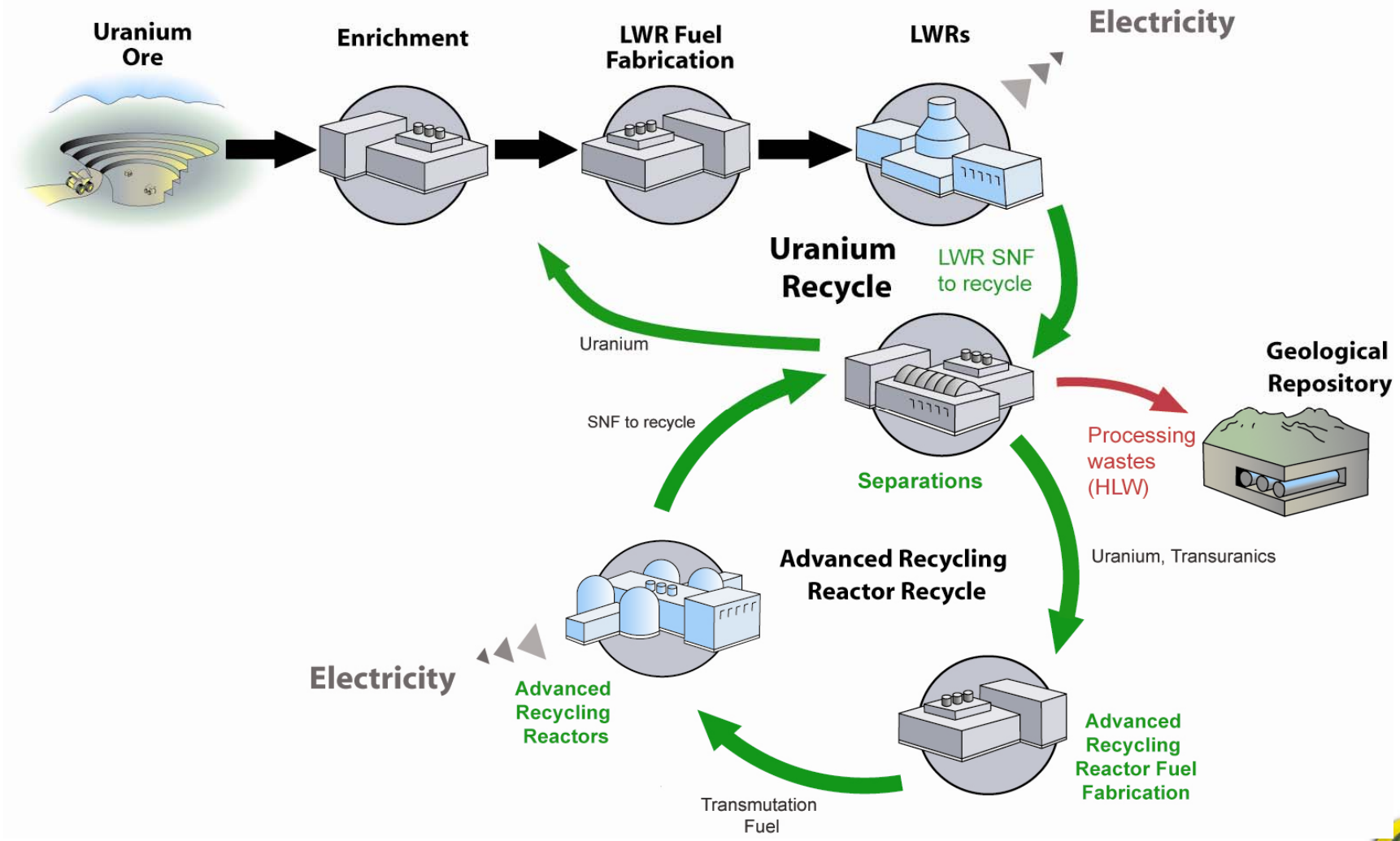
Domestic Programmatic Alternatives

- **No Action Alternative**
  - Continue existing once-through uranium fuel cycle
- **Open Fuel Cycle Alternatives**
  - Thorium Fuel
  - Heavy Water Reactor (HWR) or High-Temperature Gas-Cooled Reactor (HTGR)
- **Closed Fuel Cycle Alternatives**
  - Thermal Reactor Recycle
  - Fast Reactor Recycle
  - Thermal/Fast Reactor Recycle

No Action Alternative (Current Open Fuel Cycle)



Closed Fuel Cycle Example (Fast Reactor Recycle Alternative)



Benefits of a Closed Fuel Cycle

- **DOE supports closing the fuel cycle**
  - A specific preferred alternative has not yet been selected
- **Closing the fuel cycle meets the purpose and need objectives**
  - Supports sustainable expansion of nuclear energy
  - Will support U.S. nonproliferation objectives
  - Improves management of nuclear waste
    - *Reducing volume, thermal output, and/or radiotoxicity*
- **Closing the fuel cycle provides additional benefits**
  - Increased resource utilization and transuranic waste destruction
  - Nuclear energy expansion helps to mitigate climate change

Key International GNEP Initiatives

- **Work with partner nations to provide:**
  - Reliable Fuel Services Program: assured availability of nuclear fuel to nations that refrain from pursuing uranium enrichment and reprocessing programs
  - Grid-Appropriate Reactor Program: promote enhanced proliferation-resistant reactors designed to meet the varied US requirements and needs of developing economies

Note:

- DOE is not proposing any specific action with regard to these two international initiatives
- GNEP PEIS includes only a general, qualitative analysis of the potential impacts on the U.S. or the global commons, such as open oceans.

GNEP PEIS Environmental Analyses

- Uranium Requirements
- Enrichment and Fuel Fabrication Needs
- Land Resources
- Visual Resources
- Air Resources
- Water Resources
- Socioeconomic Impacts
- Human Health
- Transportation
- Spent Nuclear Fuel and Radioactive Wastes
- Facility Accidents/Intentional Destructive Acts

Notable Results for Domestic Alternatives

- Fast and Thermal/Fast Alternatives provide the greatest opportunity for significant reduction in radiotoxicity and both short term and long term thermal load of wastes requiring geologic disposal
- Closed fuel cycle alternatives have the greatest potential for reduction in volume of materials requiring geologic disposal
- Closed fuel cycle alternatives provide for the recovery and use of energy bearing materials that would otherwise be disposed
- In general, the closed fuel cycle alternatives would require more transportation and handling than open fuel cycle alternatives

Notable Results for Domestic Alternatives

- Impacts to workers are similar for all alternatives
- All alternatives would result in less than one latent cancer fatality per year to the populations for the 200 GWe nuclear production scenario
- Accident impacts from reasonably foreseeable accidents are comparable for all alternatives
- Land use for all alternatives is comparable

Record of Decision and Implementation

- **DOE could decide to support any of the domestic programmatic alternatives, singly or in combination.**
- **DOE's decision could impact the direction of future research, development, and demonstration activities.**
- **DOE's decision could affect the U.S. utility industry, which would ultimately determine how to implement any fuel cycle.**
  - *For example, DOE decisions could lead to proposals for grants, contracts, or financial arrangements .*
- **DOE's decision will consider the environmental impacts as well as other factors:**
  - Agency statutory mission
  - National objectives
  - Technical feasibility
  - Cost

How Can You Help Us Make a Sound Decision?

- **Provide comments:**
  - Provide input on the analysis in the GNEP Draft PEIS
  - Identify potentially significant environmental issues to be further analyzed in the GNEP Final PEIS
  - Identify any additional information needed in the Final PEIS
- **Continue to be informed:**
  - Visit GNEP website at www.gnep.energy.gov
- **Continue to be involved:**
  - Sign up for distribution list for Final PEIS

How to Provide Your Comments

- **At public hearings**
  - Oral and written
- **By U.S. mail ➔**
- **By Internet:**
  - www.regulations.gov
- **By fax:**
  - Toll free 866-645-7807

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Comment period ends December 16, 2008